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Report of final project conference, Aalborg, Denmark

Perez Collazo, Carlos

Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project

Co-funded by the Intelligent Energy Europe Programme of the European Union

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Streamlining of Ocean Wave Farms Impact Assessment

Deliverable D5.5

Report of final project conference,

Aalborg, Denmark

3rd September 2013

Co-funded by the Intelligent Energy Europe Programme of the European Union

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Streamlining of Ocean Wave Farms Impact Assessment

SOWFIA project synopsis

The Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project (IEE/09/809/ SI2.558291) is an EU Intelligent Energy Europe (IEE) funded project that draws together ten partners, across eight European countries, who are actively involved with planned wave farm test centres. The SOWFIA project aims to achieve the sharing and consolidation of pan-European experience of consenting processes and environmental and socio-economic impact assessment (IA) best practices for offshore wave energy conversion developments.

Studies of wave farm demonstration projects in each of the collaborating EU nations are contributing to the findings. The study sites comprise a wide range of device technologies, environmental settings and stakeholder interests. Through project workshops, meetings, on-going communication and networking amongst project partners, ideas and experiences relating to IA and policy are being shared, and co-ordinated studies addressing key questions for wave energy development are being carried out.

The overall goal of the SOWFIA project is to provide recommendations for approval process streamlining and European-wide streamlining of IA processes, thereby helping to remove legal, environmental and socio-economic barriers to the development of offshore power generation from waves. By utilising the findings from technology-specific monitoring at multiple sites, SOWFIA will accelerate knowledge transfer and promote European-wide expertise on environmental and socio-economic impact assessments of wave energy projects. In this way, the development of the future, commercial phase of offshore wave energy installations will benefit from the lessons learned from existing smaller-scale developments.

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Project acronym: SOWFIA

Project title: Streamlining of Ocean Wave Farms Impact Assessment

Deliverable D5.5

Report of final project conference

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1. Introduction

The SOWFIA project final conference was held as a side event of the European Wave and Tidal Conference EWTEC13 in Aalborg Denmark on the 3rd September 2013. The SOWFIA Project team presented the final results of the project in four presentations given by Deborah Greaves, Cristina Huertas Olivares, Teresa Simas and Daniel Conley. This was followed by an interactive demonstration of the SOWFIA Data Management Platform, DMP, given by José Chambel Leitão, and a reception.

The presentations are included in Annex A. 46 attended the final conference and the list of attendees is included in Annex B.

2. The final conference outcomes

The Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project (IEE/09/809/ SI2.558291) is an EU Intelligent Energy Europe (IEE) funded project that draws together ten partners, across seven European countries, who are actively involved with planned wave farm test centres. The SOWFIA project aims to achieve the sharing and consolidation of pan-European experience of consenting processes and environmental and socio-economic impact assessment (IA) best practices for offshore wave energy conversion developments.

Studies of wave farm demonstration projects in each of the collaborating EU nations have contributed to the findings. The study sites comprise a wide range of device technologies, environmental settings and stakeholder interests. Through project workshops, meetings, on-going communication and networking amongst project partners, ideas and experiences relating to IA and policy are being shared, and co-ordinated studies addressing key questions for wave energy development are being carried out.

The overall goal of the SOWFIA project is to provide recommendations for European-wide streamlining of IA and approval processes, thereby helping to remove legal, environmental and socio-economic barriers to the development of offshore power generation from waves.

SOWFIA has gathered information on consenting processes, environmental monitoring and stakeholder interests at European wave energy test centres and has analysed this information to identify commonalities and differences. The EIAs for each of the test centres have been synthesised and compared and through this analysis, the following recurrent themes in EIAs have emerged:

- **Length of Baseline Studies.** For most receptors, 2 years is identified as the minimum time to provide a baseline sufficient to detect changes attributable to the presence of WECs.
- **Electromagnetic fields.** The lack of any documented evidence of significant behavioural effect on a species level from EMF emissions by any existing undersea power cables.
- **EIA Monitoring Methodology.** A BAG (Before-After-Gradient) design may be preferred by developers over a BACI (Before-After-Control-Impact) design.

The SOWFIA Data Management Platform (DMP) is an interactive web-based tool designed to present Impact Assessment (IA) information in a format suitable for a non-technical

audience and to assist the decision-making process for wave energy consenting. The core of the DMP is composed of environmental and socio-economic datasets collected at EU wave energy test centres. Available from sowfia.hidromod.com or the SOWFIA Project website, www.sowfia.eu, access to the DMP is free to any registered users, allowing visualization and downloading of the datasets for each location.

SOWFIA Recommendations for wave energy IA streamlining are derived from consultation, workshops and dissemination activities involving a wide range of representatives from the wave energy community, including developers, utilities, regulating authorities, financiers and stakeholders. Three critical themes have emerged, in which the recommendations are presented:

- Integrated Planning and Administrative Procedures;
- Environmental Impact Assessment;
- Human Dimensions and Consultation.

The synthesis of barriers, accelerators, lessons learned and recommendations are presented below for each of these critical themes. Overall 'Strategic' and 'Operational' recommendations are given for each of the themes, resulting from the European consultation and analysis, and these are supplemented by nationally specific recommendations derived from consultation with national regulatory authorities and policy makers with the intention of making the recommendations more nationally relevant. 'Strategic' recommendations are viewed as being longer term actions perhaps requiring more significant changes and resources. 'Operational' recommendations refer to shorter term actions which could be implemented with minimal changes yet have the potential to make significant improvements to the consenting process. It should be noted that the level of resources (time/cost/re-structuring) will vary according to geographic location.

Integrated Planning and Administrative Procedures

Wave Energy Consenting Barrier		Recommendations for Ameliorating Barrier
Administrative Procedures		**Strategic Recommendations**
Barrier: Complex Administrative Procedures	Streamlining	▪ It is necessary to ensure that consenting procedures for wave energy developments are fit for purpose and viewed to be fit for purpose. ▪ Consideration should be given to interdependency of permits before embarking on new approaches (e.g. one-stop shop, parallel processing) ▪ The establishment of new or amended consenting regimes should be based on a realistic level of resources and legislative amendments
▪ Many authorities and stakeholders involved in maritime environment ▪ Many different permits required ▪ Permits vary across EU Member States ▪ In some Member States, some permits cannot be applied for until others have been granted causing long delays ▪ Developers find lack of fixed time frames to be frustrating		**Operational Recommendations**
		▪ Allocation of a dedicated co-ordinating body in Member States for wave energy consents. Note: This does not have to be a new body. ▪ Implementation of a clear process with clear procedures including responsibilities, timelines and ability to appeal. ▪ Introduction or amendment of statutory timeframes in existing legislation ▪ All test centres should provide guidance to developers on the consenting process so that developers are encouraged to deploy there and gain experience which they can then apply to future developments.

Environmental Impact Assessment

Wave Energy Consenting Barrier	Recommendations for Ameliorating Barrier
Barriers Relating to Environmental Impacts	**Strategic Recommendations**
Barrier: Environmental Impact Assessment process ▪ Inconsistency in the manner in which the EIA Directive is applied to developments across different EU Member States in terms of information required and monitoring requirements ▪ There is a feeling within the industry that the EIA process is overly burdensome on small scale developers	▪ Accelerate the rate at which understanding of the impacts of wave energy developments is being obtained. This can be done through: (i) facilitation of an adaptive management approach (ii) EU funding for research programmes on environmental impacts, especially in wave energy test centres. (iii) Require EIA data to be made publicly available (This is already the case in Denmark)
Environmental Monitoring Requirements Streamlining ▪ Unknown effects of wave energy devices on the marine environment ▪ Developers feel that monitoring requirements are too onerous for the current state of the industry ▪ Not enough guidance from regulators on the scope of EIAs ▪ Monitoring requirements subsequent to EIA can be too vague ▪ Long term monitoring results in additional costs for developers which may put off investors ▪ Environmental data availability is often compromised by developers desire for confidentiality.	▪ It is suggested that competent authorities adopt a stricter approach to EIA screening whereby only those developments likely to have significant environmental effects are subject to a full EIA.
Lack of design development in the consenting process	**Operational Recommendations**
▪ This ties developers to a fixed consent for a specific project which is a big difficulty for burgeoning industry which is rapidly changing.	▪ Baseline and impacts data should be made available at least for test centres and this could be made a condition of funding ▪ Site specific impacts should be the priority for small scale projects ▪ Results from monitoring programmes should be analysed and synthesized so as to better inform management decisions. ▪The environmental assessment should be based on site sensitivity (i.e. It should focus on things that are important in that particular location not things that should be included just for comprehensiveness). It should also be based on the size of the project and the type of device being installed. ▪ Clear environmental assessment requirements should be provided by consenting authorities to developers.

Human Dimensions and Consultation

Wave Energy Consenting Barrier

Barriers Related to Human Dimensions

Stakeholder Consultation

- In general developers have had good experiences of this to date, however, there is potential for this phase to be time and resource consuming which may put off investors.

Conflicts of use

- Many other users of the maritime environment with whom conflicts of use may arise.
- There is a lack of data as to how wave energy developments will impact on other sea users.
- Potentially conflicting objectives set at EU and national level in relation to energy and nature conservation
- Mitigation measures (e.g. adjusting location, compensation) may have consequences for the economic viability of wave energy developments.
- Integrated planning could ensure greater coordination and communication between the authorities involved in wave energy consenting and hence reduce the potential for conflicts of use. There are, however a number of barriers related to integrated planning:

  (i) There is a lack of strategic planning involving and integrating all uses in the marine space

  (ii) There are different levels of MSP implementation in Member States and there is usually a disconnect between MSP, SEA and EIA processes

  (iii) MSP tends to reflect existing uses more fully than future potential uses like ocean energy developments

Streamlining

Recommendations for Ameliorating Barrier

Strategic Recommendations

- Credible, evidence based information, both scientific and socio-economic should be presented to stakeholders in an accessible and understandable format.
- Realistic timelines should be provided to stakeholders to respond/ make submissions
- In terms of strategic planning:

  (i) Responsible government departments at national level should integrate and coordinate their policies and implement these policies through a dedicated MSP supported, where necessary , by an appropriate consenting system. It is important to note that MSP is not, however, a replacement for sectoral planning rather it seeks agreement between the plans that each sector develops for a given area.

  (ii) Carry out SEAs of specific plans and programme areas to ensure strategic government oversight and avoid conflicts between sectors and ultimately marine users.

Operational Recommendations

- Developers should make sure that consultation with everyone takes place at an early stage
- Consenting authorities should provide developers with a list of stakeholders.
- Suitable representatives should be selected to consult with stakeholders to build trust
- Developers should have suitable consideration for the audience they are consulting with and arrange meetings at appropriate times
- In terms of strategic planning:

  (i) Guidance documents should be produced to advise wave energy developers and other stakeholders on the siting of their developments within a given area and how to negotiate the consenting process applicable to their activity

  (ii) Public databases should be developed with information on marine natural resources and uses respectively, including information on coastal infrastructure and socio-economic aspects.

Annex A: Final conference presentations

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Final Conference 3 September, 2013 - Aalborg

The SOWFIA Project: Streamlining of Ocean Wave Farms Impact Assessment Introduction and Context

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SOWFIA: Streamlining of Ocean Wave Farms Impact Assessment

MARINE RENEWABLE ENERGY WITH PLYMOUTH UNIVERSITY
EXETER
WaveEnergy Centre
INABENSA
EVE Ente Vasco de la Energía
HMRC UCC
HIDROMOD

- Network of 10 EU partners
- 6 +1 Wave Energy Test Centres within EU
- Collating Environmental and Socio-Economic Information from EU Sites.

? Unknown Environmental and Socio-Economics Impacts of Wave Farms

? Uncertainties on adapting regulatory process for Wave Energy (and Tidal)

? Lack of coordinated IA policies

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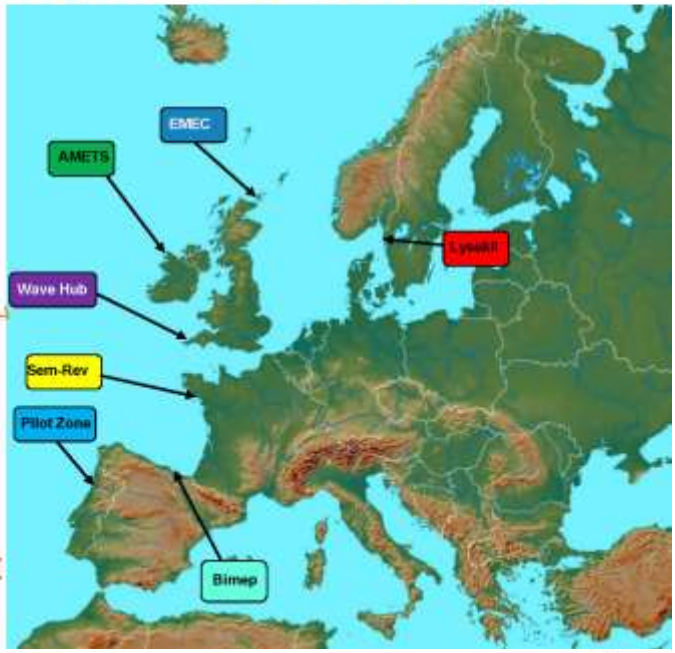
SOWFIA: Streamlining of Ocean Wave Farms Impact Assessment

- Project conceived in 2009
- Array Focus
- Study Test Centres for Wave Energy Arrays
  - Experience
  - Data
- Non-technological barriers
- Europe wide
- Project now in final year:

Wave energy arrays still not a reality



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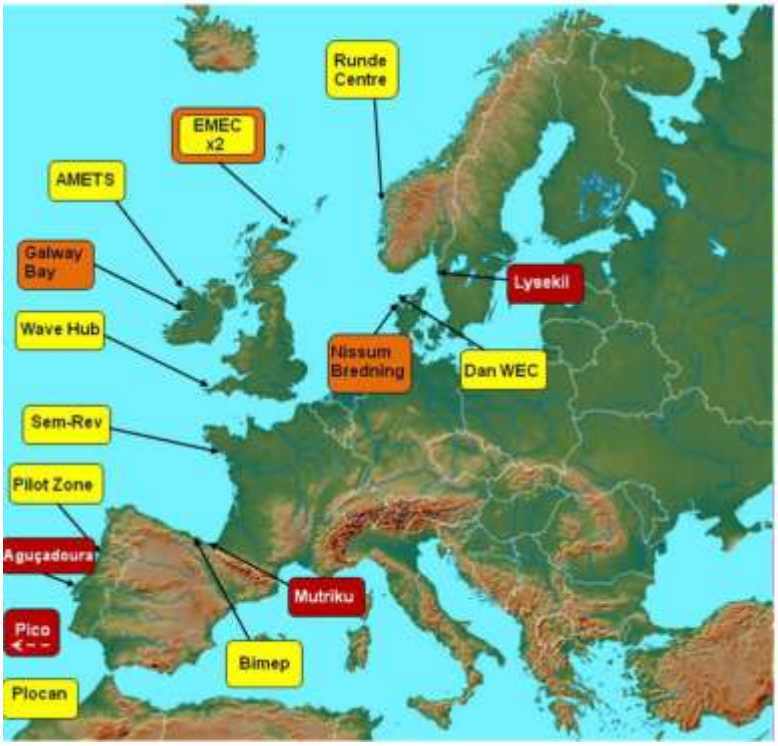

Test Centres

National Wave Energy Test Centres in Europe

9 Full Scale Sea Trial Sites

4 Large Scale (circa 1:4) Nursery Sites

4 Semi-Commercial Developments available for Component Trials

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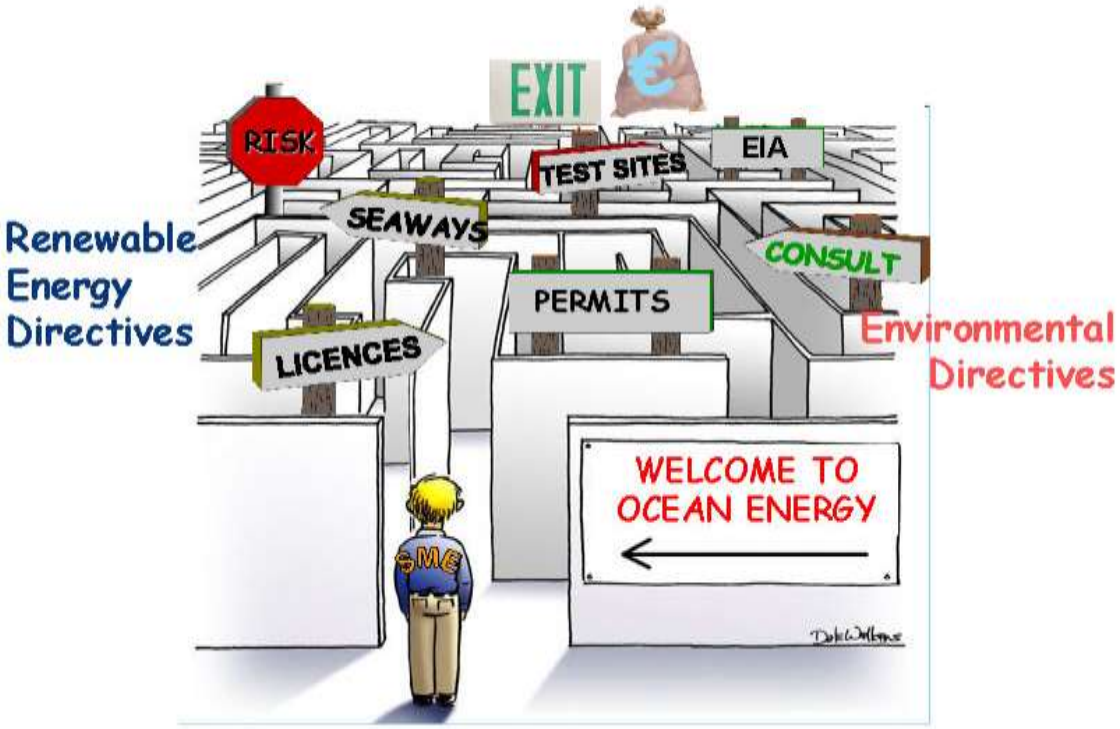

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Energy and Environment

- **Import dependency:**
  Europe - 53% (83% oil, 60% gas)
- **Security of supply.**
- **Climate change:**
  Mitigation;
  Emissions reduction targets.
- **Diversity of supply.**

- **Deterioration of the marine environment.**
- Increasing and new **uses of Europe's marine areas.**
- Recognition that all matters relating to Europe's oceans and seas are **interlinked.**
- EU's **Integrated Maritime Policy (2007)**

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Development of new Renewable Energy Industry....

- EU-OEA Roadmap 3.6 GW total ocean energy installation by 2020.
- UK NREAP target for ocean energy 1300MW by 2020.
- 15 - 20% of current UK demand to be met by wave and tidal energy in the long term

2020

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....whilst safeguarding the Environment

What can go wrong?

Hallsands coastal erosion

www.southhams24.co.uk

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Environmental impacts on biodiversity

- Benthic biodiversity – important invertebrates & fish associated with the seabed & fixtures




- Fisheries consequences (fish stocks/movement, operator impact, socio-economics)



- Mobile large vertebrates (cetaceans, seals, turtles, birds, basking sharks)




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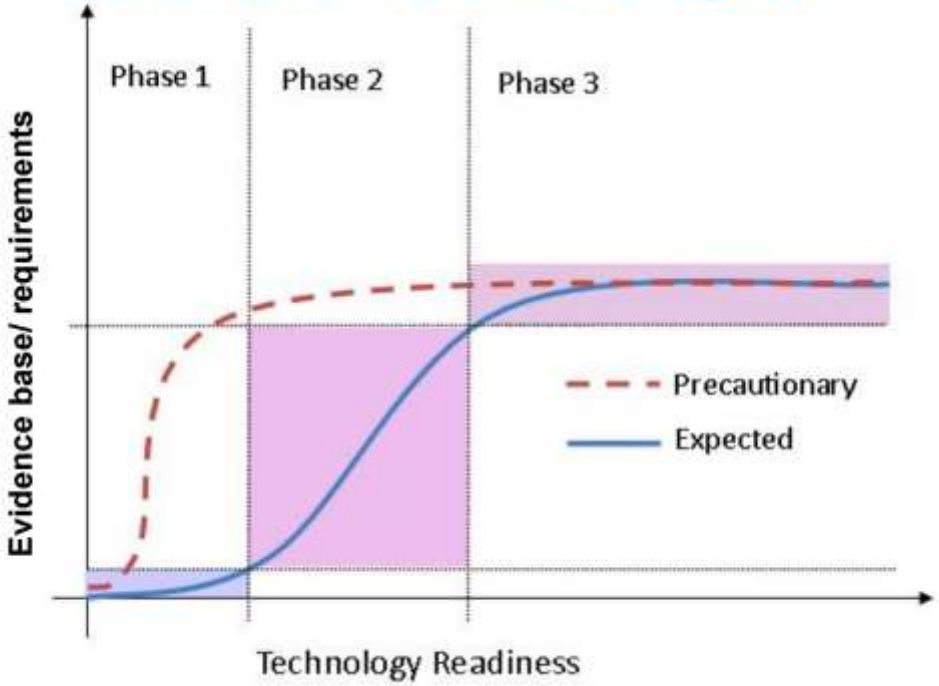
But is the balance right?



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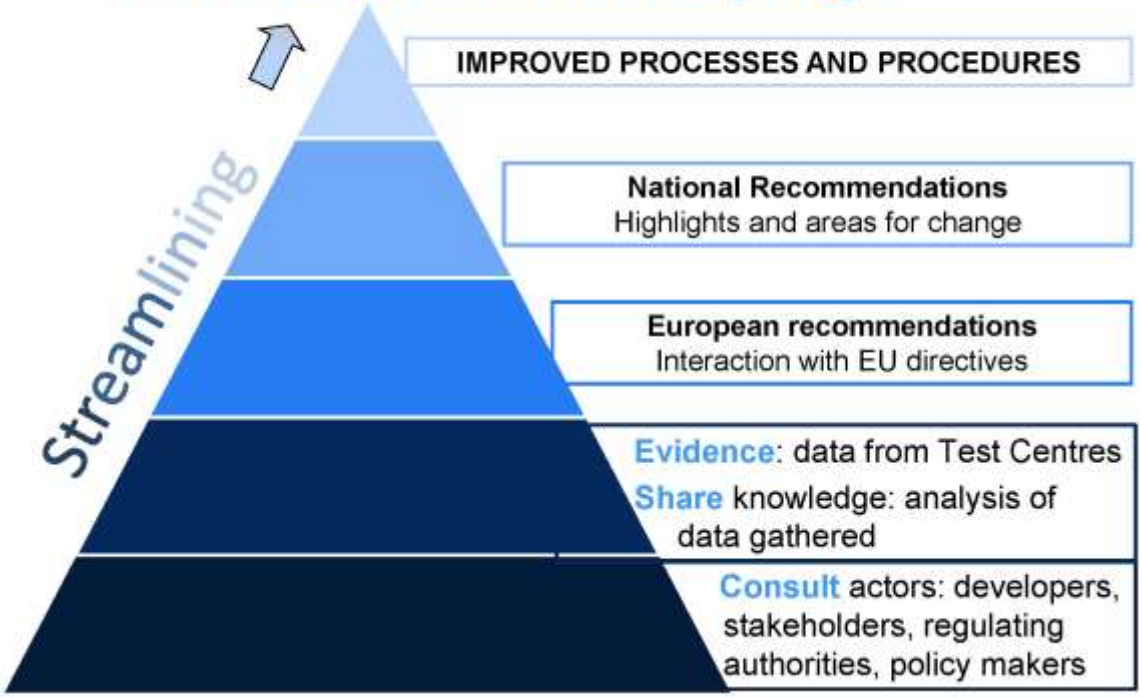
How is SOWFIA helping?



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Actions for Streamlining

Recommendations for Streamlining

- Addressing "Non-technological barriers" that are hindering development

Development of Data Management Platform

- Addressing EIA monitoring in terms of key environmental factors, monitoring standards and data sharing

Policy Process

- European Recommendations → National Recommendations

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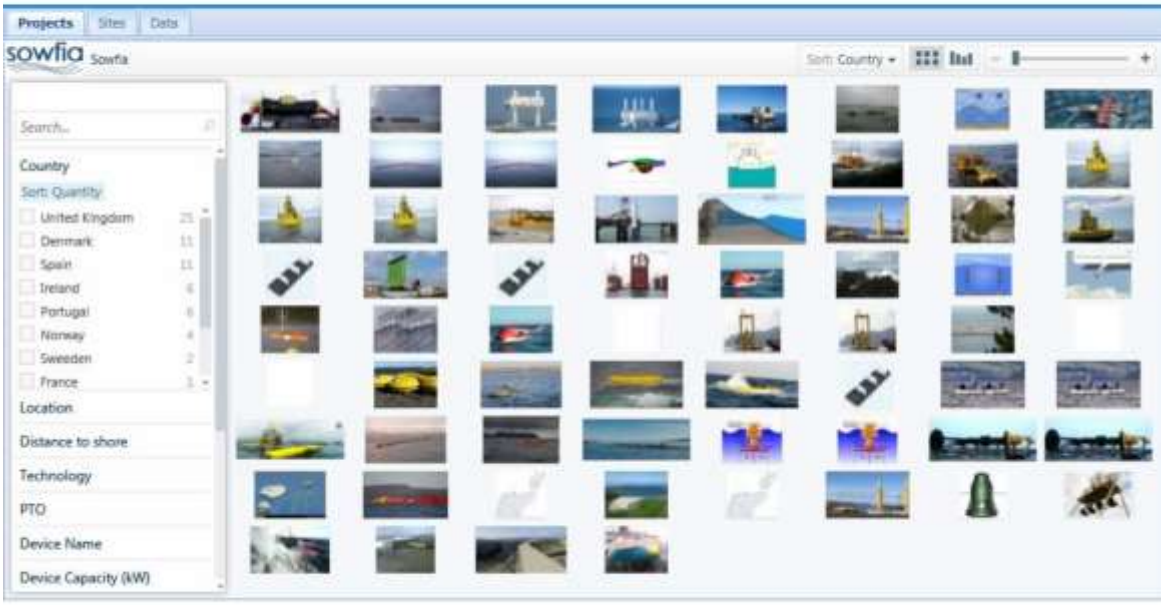
Data Management Platform



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SOWFIA Recommendations

Critical Themes:

- Planning Processes and Administrative procedures
- Environmental Impact Assessment (EIA and monitoring)
- Human dimensions and Consultation

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THEME 1 – Planning processes and administrative procedures

Cristina Huertas, Abengoa Seapower, Spain
Anne Marie O'Hagan, HMRC-UCC, Ireland

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Context
Barriers
Accelerators
Recommendations

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Context:

- Long recognised as a 'non-technical barrier'
- Many different authorities are stakeholders in the marine and coastal environment
- Ultimately can lead to perceived greater risk

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Barriers:

- Complex and long = higher costs
- Lack of certainty and consistency in procedures

  Example: Often there are no timelines associated with the various elements of the process
- Perceived as overly-onerous on new, single device and/or time-limited deployments
- Lack of communication between authorities

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Barriers:

- Current status of the industry
- Law and policy objectives can 'conflict' with each other and with industry objectives
- Lack of coordinated and integrated planning approaches (e.g. Maritime Spatial Planning, Integrated Coastal Management)

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Accelerators:

- More integrated planning process that are adaptive and inclusive
- Better public participation in planning process
- New approaches to consenting, for example, MSP; a 'one-stop shop', etc.
- Proposed Directive on Maritime Spatial Planning and Integrated Coastal Management (COM 2013/133 final)

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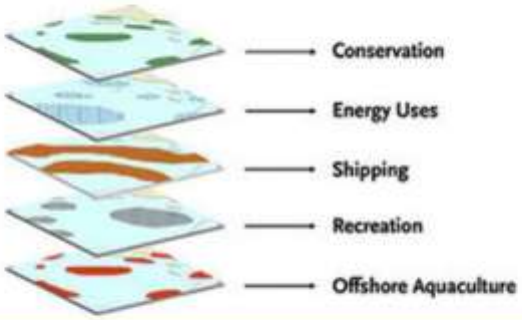
Accelerators: Maritime Spatial Planning (MSP)



It is plan-led; allows stakeholders to work together; is based on sound science; promotes open and transparent governance; is flexible and adaptable; utilises existing and new information; reduces complexity and duplication.
And.... management can **no longer** be sectoral*!*

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Accelerators:

One-stop shop

Stronger **communication and cooperation** in **all phases of development**; saves **time and money**; provide greater **certainty;**

Paralell process

Fast

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Recommendations:

Strategic	Operational
Integrated and coordinated policies are needed across regulatory authorities	Guidance on the consenting process and associated administrative procedures are needed by developers
Better connection between SEA, EIA, AA and over-arching policies	Improve information for the public and other stakeholders
Consenting processes should be fit for purpose regardless of development scale	Allocate a dedicated coordinating body – doesn't have to be a new body!
Procedural changes should be based on realistic levels of resources and legal amendment.	Adopt a clear process with assigned responsibilities, timelines and appeal procedures
Consideration should be given to the interdependency of permits before embarking on new approaches (one-stop shop or parallel processes)	In relation to test centres, ensure consistency of procedures across Europe as far as practicable.

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The SOWFIA Project: Streamlining of Ocean Wave Farms Impact Assessment Environmental Impact Assessment and Environmental Monitoring

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Context

EU and National legislation to take into account the environmental implications of projects before a licence awarded

Birds Directive (2009/147/EC), Habitats Directive (92/43/EEC), Marine Strategy Framewok (2008/56/EC) and the Water Framework Directive (2000/60/EC) *all influence monitoring requirements*

Wave energy projects may be required to undertake an "EIA" (Directive 2011/92/EU) as ocean energy installations qualify under Annex II

Most wave energy projects to date have been subject of EIA irrespective of size and duration.

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Goals

Largely focusing on the experience of the 6 test centres represented, SOWFIA sought to

- identify key receptors
- review monitoring requirements and methodologies
- suggest data dissemination/presentation techniques
- summarise initial experience on impacts
- Provide recommendations on steps to streamline wave energy EIA

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Experience*

Receptors		AMETS	BIMEP	LYSEKIL	OCEAN PLUG	SEM REV	WAVE HUB
Physical Environment	Water quality and ground water	MODERATE	COMPATIBLE	COMPATIBLE	N/A	MODERATE	COMPATIBLE
	Physical processes	MODERATE	SEVERE	COMPATIBLE	N/A	COMPATIBLE	COMPATIBLE
	Air quality and climate	COMPATIBLE	N/A	N/A	N/A	N/A	N/A
Flora and Fauna	Marine mammals	MODERATE	SEVERE	COMPATIBLE	SEVERE	COMPATIBLE	COMPATIBLE
	Sea birds	MODERATE	MODERATE	COMPATIBLE	SEVERE	COMPATIBLE	COMPATIBLE
	Fish and shellfish	N/A	Noise --> MODERATE EMF --> SEVERE	COMPATIBLE	N/A	COMPATIBLE	COMPATIBLE
	Benthos	MODERATE	Increased Turbidity -->MODERATE Anchors and moorings dragging --> SEVERE	N/A	N/A	COMPATIBLE	COMPATIBLE

*SOWFIA D3.5, WP3 Final Report

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Lack of consistency in the application of the EIA Directive across Europe

Barriers	Accelerators
• Member States interpret and apply the EIA Directive in a non-consistent manner. Ineffective screening • Scoping not mandatory among EU Member States. Can compromise requirements and delays the process	• Proposed amendment of the EIA Directive will strengthen procedural elements of the EIA Directive and increase consistency.

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Unknown effects of WECS on the marine environment and environmental monitoring

Barriers	Accelerators
• Uncertainty of effects often translates as onerous environmental monitoring requirements • Small developers feel that monitoring requirements are excessive considering likely significance of effects	• Test centres develop information on effects of wave energy, monitoring methodologies, and effectiveness of mitigation measures • Use experience from other marine sectors

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Environmental data availability

Barriers

- Data availability is sometimes compromised by the developer's desire for confidentiality
- Diversity in monitoring methodologies across projects inhibits comparison of results

Accelerators

- Tools such as the SOWFIA Data Management Platform are valuable as a source of such environmental information and making it available to regulators, developers and other interested stakeholders

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Lessons and steps forward

Monitoring
Review of monitoring topics and methods at Test Centres to identify commonalities and differences.

Data Format
Based on common format with consistent metadata .
Inspire Directive

Data Sharing
Data repository to promote data sharing among Test Centres and more widely

Data Presentation
Data presentations developed to promote understanding among wide range of stake holders

Risk?
Information obtained to help implement Risk Based Approach. Reduce monitoring burdens.

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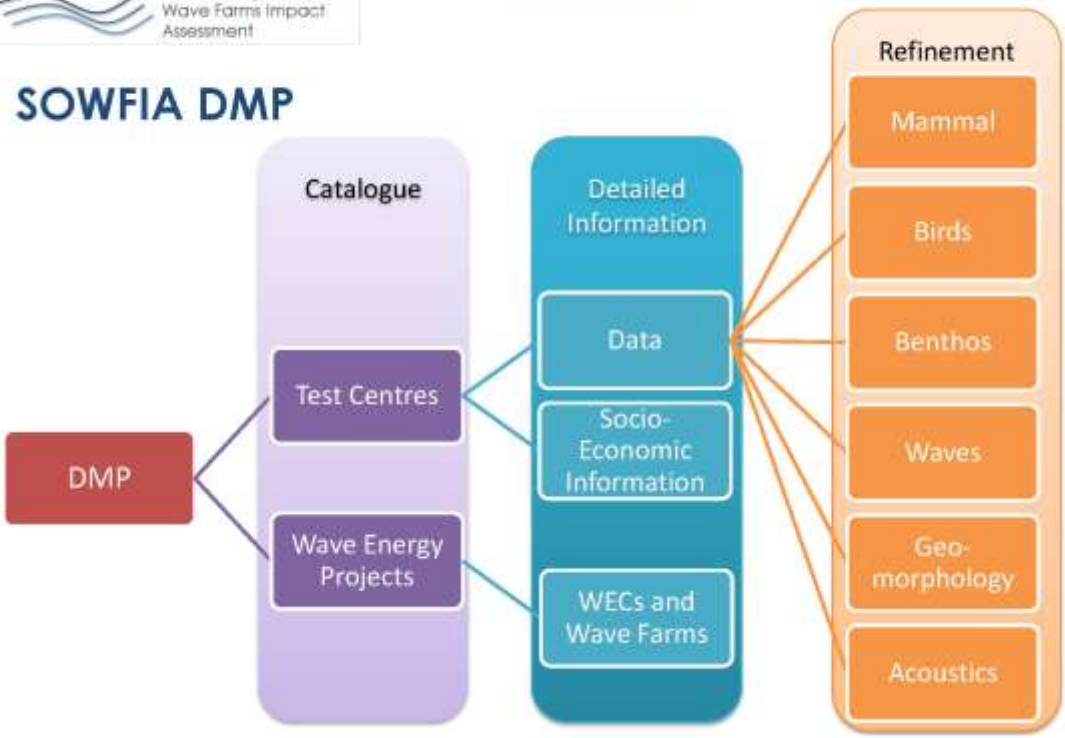
SOWFIA DMP



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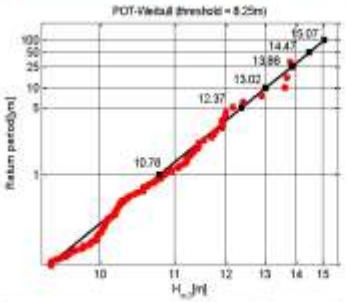
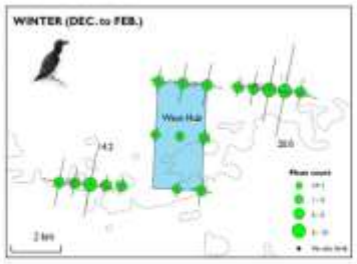
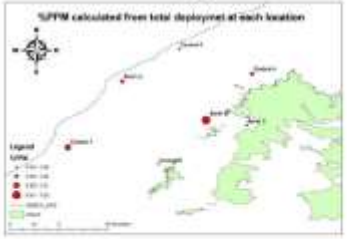
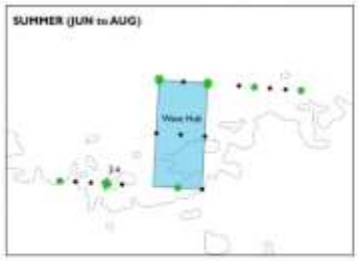
Refined Data Products









- *Help make data comprehensible*
- *Ease data interpretation*
- *Highlight key features*
- *Facilitate cross site comparisons*
- *Permit EU wide scale analysis*

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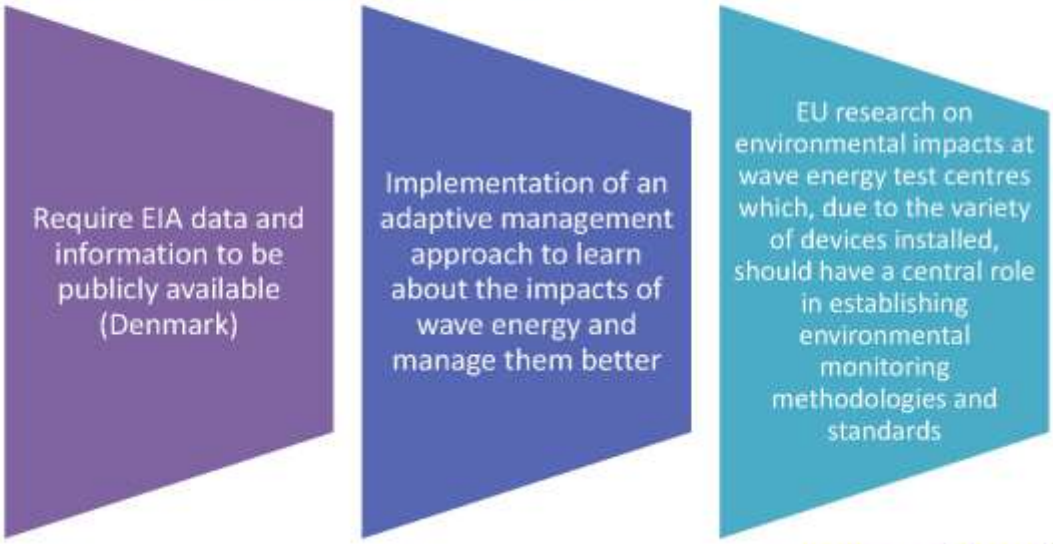
Strategic Recommendations



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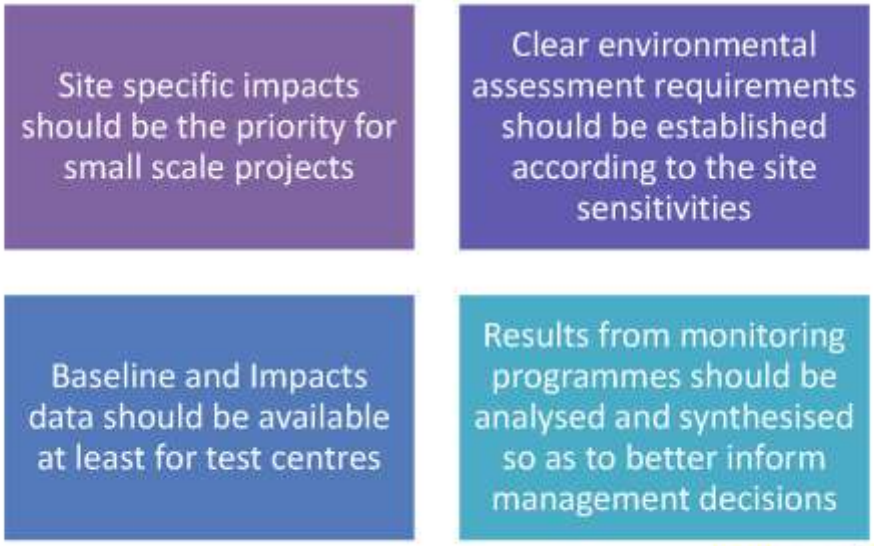
Operational Recommendations



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Common Monitoring Themes

- 2 years sampling is seen as minimum time sufficient to detect changes attributable to the presence of WECs
- No documented evidence of significant behavioural effect at a species level from EMF exposure (buried cables).
- BAG design preferred over a BACI design for wave energy EIA monitoring purposes due to BACI requirement for appropriate control site and sufficient number of replicates

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Final conference

3rd September – EWTEC 2013, Aalborg

Human dimensions and Consultation

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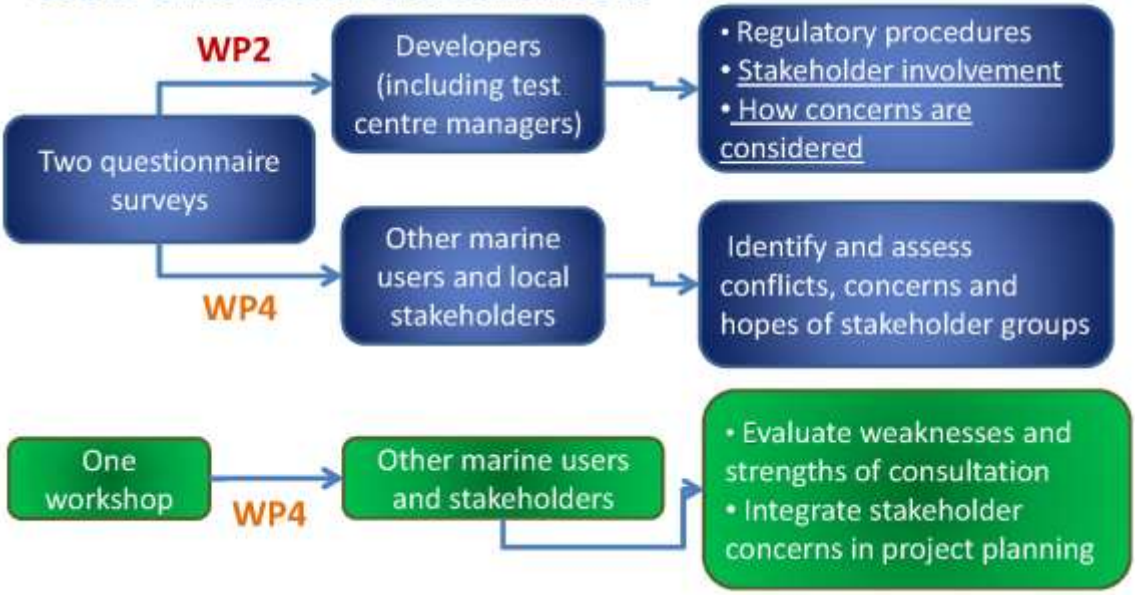
Activities to assess the views of other marine users and local stakeholders



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Questionnaire survey

Questionnaire 1	
Test centres	Developers
AMETS, Bimep, EMEC, Lysekil, Ocean Plug, Runde, SEM-REV, Wave Hub	Aquamarine Power, Mutriku, Pelamis Wave Power, WaveRoller, Wave Star, West Wave Power, Marine Current Turbines, Tidal Generation Limited, UU / Seabased
Questionnaire 2	
Test centres	Stakeholder groups
AMETS, Bimep, EMEC, Lysekil, Ocean Plug, SEM-REV, Wave Hub	Local authorities Local businesses Interest/activity representative organisations (e.g. fishing, surfing) Residents

Table 1: Interviewed entities.

Developers (including test centre managers)

Other marine users and local stakeholders

672 questionnaires (Report 4.3)

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Workshop B: *Taking Wave Energy Forward: Implementation and Community Integration*

1st Session (included in EMD programme)

- Stakeholders key viewpoints and issues
- Views on conflicts management

2nd Session

- How to ensure stakeholder views are heard and taken into account in wave energy projects
- Evaluate strengths and weaknesses of consultation processes
- Improve integration of stakeholder interests into decisions

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Stakeholders' views and opinions on wave energy

Overall opinions appear positive: increase in low-carbon energy production, reduced dependence on fossil fuels, reduced energy prices? Economic/employment opportunities

Reduced dependence on energy imports most strongly expressed by respondents from southern European test centres

Employment benefits are expected but specialist skills needed may lead to recruitment from outside region instead of local work force

Negatives: Conflicts related to shared use of sea areas, potential adverse environmental effects and high costs of projects

Potential visual and environmental impacts are generally judged to be less serious than for offshore wind farms

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Stakeholders' views and opinions on consultation

Purpose	Technique	Information
• To increase public awareness about MRE in general, as well as providing project-specific information • To encourage the participation of local businesses and the public in consultation processes • Levels of consultation needed may differ according to stakeholder group	• Actively engage local media to provide regular project updates • Avoid consultation 'fatigue' to maximise participant input • Select time and location of consultations carefully to meet needs of different groups • Upfront recognition of what consultations can and cannot influence • Clearly explain to stakeholders how their input will be used	• Information provided should be clear, transparent and honest • Stress project benefits acknowledge adverse effects to build trust • Stakeholder groups should produce list of concerns to raise at consultation events • Ensure enough time for information to be reviewed • Socio-economic impacts are of critical concern to stakeholders

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Key issues

Issue	Description
Aesthetics	Disturbance of seascapes (less than for off-shore wind)
Use conflicts	Navigation restrictions; effects on fish stocks/access to stocks; effects on wave conditions & environmental quality; future scale of developments
Economics	Overstated estimates of economic/employment gains; few benefits to locals in regions
Information	Uncertainty & technical focus of scientific & socio-economic information impedes assessment by non-experts
Trust	Key decisions made or pre-programmed before consultation
Involvement	Cost; timing and location of consultations; inappropriate stakeholder representatives consulted

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Project recommendations on consultation

Strategic	Operational
Credible, evidence-based scientific and social-science information in accessible and understandable format	• Public databases on marine resources and uses of marine areas
Realistic timelines for stakeholders to respond/make submissions	• Ensure consultation begins early in planning/consenting process • Consideration for needs of stakeholder audiences (venue, timing, format etc.) • Liaison with suitable representatives to promote participation and trust
Integration of national policies for strategic planning of marine energy through MSP, supported by appropriate consenting system	• Guidance documents to advise regulators, developers and stakeholders on siting of developments and consenting/consultation processes
SEA of specific plans & programmes to ensure strategic oversight of conflicts over use and interests: Alternatives!	www.sowfia.eu/

Annex B: List of attendees

Name	Country	Affiliation
Andrea Copping	USA	Pacific Northwest National Laboratory
Philipp Thies	England	University of Exeter
Ian Ashton	Scotland	European Marine Energy Centre
Cristina Huertas	Spain	Abengoa Seapower
Dorleta Marina	Spain	EVE
Carlos Perez Collazo	England	University of Plymouth
Deborah Greaves	England	University of Plymouth
Daniel Conley	England	University of Plymouth
JB Sulnier	France	ECNantes
Philip Gleizon	United kingdom	ERI
Jan Sundgerg	Sweden	Uppsala University
François Lienard	Belgium	EU OEA
Mathew Witt	England	University of Exeter
Khilan Shah	England	University of Southampton
Olly Lever	Scotland	Aquaterra
Ian Hutchison	Scotland	Aquaterra
David Wooh	Scotland	ICIT, Heriot Watt University
Mathew Finn	Scotland	EMEC
Cameron McNatt	Scotland	University of Edinburg
Thomas Roc	England	IT Power
Victor Winands	Germany	
Tom Blackmore	England	University of Southampton
Linus Hammar	Sweden	Chalmers University
Jun Zang	England	University of Bath
Rich Walker	England	Mojo Maritime
Mark Leybourne	England	IT Power
IAN Masters	Wales	Swansea University
James King	Australia	Medow Pty Ltd
Paul Bird		Brenf Measurement

Luis R. Nuñez Rivas	Spain	Technical University of Madrid
Peter McCallum	Scotland	University of Edinburg
Lucia Margheritini	Denmark	Aalborg University
Erik Friis-Madsin	Denmark	Wave Dragon
Yukio Kamizuru	Germany	Bosch Rexroth
Raphael Hon	USA	Wavewatts Inc
Hans Christian Sørensen	Denmark	Wave dragon
Thomas H. Viuff	Denmark	Aalborg University
Thomas Lake	Wales	Swansea University
Francisco Francisco	Sweden	Uppsala University
Julia Fernandez Chozas	Denmark	Julia F. Chozas, Consulting Engineering
Robert Stringer	England	University of Bath
Aby Iyer	Scotland	University of Edinburg
Duncan Sutherland	Scotland	University of Edinburg
Jean Baptiste Richard	Germany	Fraunhofer IWES
Peter Stansby	England	University of Manchester
Jose Chambel Leitao	Portugal	Hidromod